

YAKHONTOV, L.N.; URITSKAYA, M.Ya.; RUBTSOV, M.V.

Derivatives of 7-azaindole. Parts 14-16. Zhur. org. khim. 1
no.11:2029-2046 N '65. (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy
institut imeni S. Ordzhonikidze. Submitted July 20, 1964.

YAKHONTOV, L.N.; URITSKAYA, M.Ya.; RUBTSOV, M.V.

Derivatives of 7-azaindole. Part 6: Synthesis of
4-methyl-7-azaindole and its 6-chloro, 6-iodo, and
6-methoxy derivatives. Zhur. ob. khim. 34 no. 5:1449-1455
My '64.

Derivatives of 7-azaindole. Part 7: Dehydrogenation of
indoline and 7-azaindoline derivatives with sodium in
liquid ammonia. Ibid.:1456-1458 (MIRA 17:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy
institut imeni S.Ordzhonikidze.

CHERNIKHOV, V. S.; URITSKAYA, V. M.

D6cent, Dnepropetrovsk Affiliate of State Planning Inst. for Metallurgical Plants,
-c1948-.

"Utilization of steel to replace the cast-iron charging boxes of casting machines,"
Stal', No. 7, 1948

URITSKAYA, V. M.

25054

Zamena Churunnykh Mul'd Razlivochnykh Mashin stalbnymi. Stal', 1948, No.7, s.
591-93

SO: LETOPIS NO. 30, 1948

URITSKAYA, Ye. G.

"The Effect of the Mechanoreceptors of the Stomach on the Higher Nervous Activity of Canines." Cand Med Sci, Molotov State Med Inst, Molotov, 1953. (RZhBiol, No 6, Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No., 521, 2 Jun 55

USSR/Human and Animal Physiology (Normal and Pathological).
Nervous System. Higher Nervous Activity.
Behavior.

T

Abs Jour: Ref Zhur-Biol., No 17, 1958, 80046.

Author : Skachebub, R.G.; Uritskaya, Ye. G.

Inst :

Title : Motor-Defensive Conditioned Reflexes in Dogs During
a Change of the Excitability of the Food Center.

Orig Pub: Tr. Molotovsk. ned. in-ta, 1957, vyp. 26, 17-22.

Abstract: In tests with 5 dogs possessing established motor-
defensive conditioned reflexes (CR) and differen-
tiation to light and sound, it was found that full
satiation with food (temperature 20-35°) did not
change CR during low food excitability, but during

Card : 1/2

USSR/Human and Animal Physiology (Normal and Pathological).
Nervous System. Higher Nervous Activity.
Behavior.

T

Abs Jour: Ref Zhur-Biol., No 17, 1958, §0046.

great excitability in two dogs, through 10-15 minutes after the food, CR were inhibited and in one case - increased. Through 30-40 minutes, a primary depression of CR in all dogs occurred. False feeding in one dog increased CR; in another, it did not change then. The stimulation of the stomach by a balloon with 200 ml of water 36-38° had no influence on CR, at 42-48° CR increased, and during 50-60° and 0.5-9° was inhibited. These changes appeared through the 10 minutes following the beginning of stimulation.

Card : 2/2

106

URITSKAYA, Ye.G.

Cardiac activity related to the influence of hypo-, iso- and hypertonic solutions on the muscles. Biul. eksp. biol. i med. 49 no. 5:6-10 My '60. (MIRA 13:12)

1. Iz kafedry normal'noy fiziologii (zav. - prof. M.R. Mogendovich) Permskogo gosudarstvennogo meditsinskogo instituta. Predstavlena daystvitel'nym chlenom AMN SSSR V.V. Parinym.
(HEART) · (MUSCLES)

URITSKAYA, Ye.G.

Changes in the gum temperature in the orthostatic test. Eksp.
issl. po fiziol., biokhim. i farm. no.3:185-190 '61
(MIRA 16:12)

Reflex effects of the skeletal muscles on the respiratory
and cardiovascular systems in strychnine poisoning. Ibid.:
193-202

42205
S/139/62/000/005/006/015
E032/E314

247700

AUTHORS: Uritskiy, E.I. and Asadullin, Ya.Ya.

TITLE: On the theory of phonon thermal conductivity

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
no. 5, 1962, 89 - 91

TEXT: The theory of the thermal conductivity of dielectrics, which is determined by lattice vibrations, has so far been only concerned with the scattering of lattice vibrations in cases where scattering by impurities, defects and free carriers can be neglected. However, it is pointed out that there is a further mechanism of scattering which is due to spontaneous decay of a phonon owing to the polarization of the electron-hole vacuum in which (1) a phonon q excites an electron from a state k_0 in the valence band into a state k_1 in the conduction band, and then an electron in the state k_1 experiences a transition to a state k_2 in the conduction band with the creation of a phonon q' and back to the state k_0 with production of the phonon q'' , or (2) an electron

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S/139/62/000/005/006/015
E032/E314

On the theory of

from the state \underline{k}_2 in the valence band experiences transition into the state \underline{k}_0 with the creation of a phonon g' and then an electron \underline{k}_1 goes into \underline{k}_2 with the creation of a phonon g'' .
The transition matrix element is evaluated for both processes and a quantitative condition is derived for this mechanism to become appreciable. It is concluded that the process can, in fact, become appreciable in sufficiently pure semiconductors. ✓

ASSOCIATION: Kazanskiy gosuniversitet imeni V.I. Ul'yanova-Lonina (Kazan' State University imeni V.I. Ul'yanov-Lenin)

SUBMITTED: May 22, 1961

Card 2/2

SOLOLOVSKIY, P.I.; ODEISKIY, P.D.; BRISKIY, M.R.; BARYNINA, I.M.; CHERNASHKIN,
V.G.; POZENSHTAYN, I.M.; KISSAL', M.N.

Low-carbon Bessemer steel for structural elements. From: stroi. 42
no. 7:29-32 '65. (MIRA 18:8)

1. Tsentral'nyy nauchno-issledovatel'skiy institut stroitel'nykh konstruktsiy (for Barynina).
2. Nauchno-issledovatel'skiy institut po montazhnym i spetsial'nym stroitel'nym rabotam (for Pozenshtayn).
3. Zhdanovskiy metallurgicheskiy zavod im. 11'isha (for Kissal').

L 45151-66 EWT(m)/SWP(w)/EWP(v)/T/EWF(t)/ETI/EWP(k) IJP(c) JD/HM/HW
ACC NR: AP6027434 (A) SOURCE CODE: UR/0125/66/000/007/0070/0073

AUTHOR: Sokolovskiy, P. I.; Uritskiy, M. R.; Bogomolova, A. S.

29
22
B

ORG: [Sokolovskiy; Uritskiy] TSNIISK; [Bogomolova] UralNITI

TITLE: High-strength welded pipe for structural designs

SOURCE: Avtomaticheskaya svarka, no. 7, 1966, 70-73

TOPIC TAGS: structural design, construction, welded pipe, pipe steel/S-40 steel, S-70 steel

ABSTRACT: Today's expansion of construction has given rise to new structural high-strength steel sections of modern design, thin-walled tubular shapes being among those in greater demand. Owing to their higher resistance to both twisting and aerodynamic forces, tubular sections of high-strength steel offer a considerable economy of metal. Investigations have shown that the substitution of S-75 steel in thin-walled tubular sections for S-24 grade steels has allowed weight reduction by one half and has produced a saving of 25-30% in cost. As compared

Card 1/2

UDC: 621.791.77:621.648.2/.3

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ACC NR: AP6027434

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to others, tubular shapes have greater aerodynamic resistance, a major factor in construction of towers and masts. Most commonly used diameters in hot-rolled seamless pipe are 50—300 mm. The criterion of maximum effectiveness in a tubular section is the D/t ratio (where D is the outer diameter and t , the wall thickness). The higher this ratio, the greater the moment of inertia of the cross section for the same amount of metal. For consideration of local stability and joint rigidity, the maximum ratio is set at 100. The paper offers three methods of making straight-seam pipe in S-40 to S-70 grades: 1) bending and welding of coil sheet having the necessary strength prior to these operations; 2) attaining the required strength by normalizing the pipe of hot-rolled or annealed coil sheet; and, finally 3) obtaining the necessary strength of pipe by heat treatment, i. e., hardening and tempering. A variety of grades is given in the original article. Their chemical composition and graphs for the mechanical properties of some of these steels under various heat-treating conditions are presented. Normalizing is suggested as the preferred type of heat treatment. The authors note the participation of Engineer A. M. Chirkin in the experimentation as well as the assistance of the UIChM and IES Institutes in the development of various grades of pipe steels. Orig. art. has: 3 figures and 3 tables. [LD]

SUB CODE: 13/ SUBM DATE: 19Jan66/ ORIG REF: 004/

Card 2/2

URITSKIY, N., direktor fil'moteki.

Useful matters. Kinomekhanik no.10:10-11 0 '53.

(MLRA 6:10)

(Moving-pictures in education)

URITSKIY, N.Z. (Moskva)

Pedagogic exhibition. Mat. v shkole no.5:85-86 S-O '56.
(Moscow--Mathematics--Study and teaching) (MLBA 9:10)

L 58517-65 EWA(E)/EWT(1)/T Pz-2/Peb IJP(c)

ACCESSION NO: AP5016275

UR/03/6/65/001/005/0001/0005

21
E

AUTHOR: Sirota, D.; Uritskiy, Z.; Shuster, G.

... the ... of semiconductor ... in a quantizing magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 5, 1965, 1-5

TOPIC TAGS: diamagnetic susceptibility, semiconductor diamagnetism, carrier scattering, optical phonon, quantizing magnetic field

ABSTRACT: The purpose of the investigation was to ascertain whether the diamag-

by ...

$$E = \sum_{\mathbf{q}} \omega_{\mathbf{q}} (c_{\mathbf{q}}^{\dagger} c_{\mathbf{q}} + 1/2) + \sum_{\mathbf{q}} G_{\mathbf{q}} (1 - u_{\mathbf{q}}^{\dagger} c_{\mathbf{q}} a_{\mathbf{q}} + \text{Herm. conj.})$$

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L 5071-01

ACCESSION NR: AP5016275

1965

... of the ... (THEY v. ...)

$$\left[R^2 \cdot \frac{n' - n}{q_1^2} \cdot P_n \cdot \frac{P^2 \cdot \frac{n' - n}{q_1^2} \cdot (1 + n_0)}{2} \right]$$

The ...

$$u = \frac{1}{2H} \cdot \frac{1}{2H} = \frac{1}{4H^2}$$

L 58517-65

ACCESSION NR: AP5016275

the resonant absorption of the optical phonons leads to peaks
relating to the exponential de-

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gai . S.
University

SUB CODE: 88, CF

I. 8979-66 EMT(1)

LJP(c)

ACC NR: APS027429

SOURCE CODE: UR/0181/65/007/011/3415/3417

AUTHOR: ⁵⁵⁻⁴¹Uritskiy, Z. I.; ⁵⁵⁻⁴¹Shuster, G. V.

ORG: ^{44, 55}Ural State Institute im. A. M. Gor'kiy, Sverdlovsk (Ural'skiy gosudarstvennyy universitet)

TITLE: Theoretical study of intraband magneto-optical effects

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3415-3417

TOPIC TAGS: Faraday effect, ^{21, 44, 55}magnetooptic effect, semiconductor band structure, semiconductor theory, theoretic physics

ABSTRACT: The Faraday and Voigt magneto-optical effects are studied with regard to transitions with a change in spin direction. A formula is derived for the angle of rotation of the polarization plane for the Faraday effect. The first term of this equation describes ordinary rotation due to transitions between Landau levels. The second term accounts for rotation due to spin transitions. The contribution from this second term may be considerable for bands with a large g -factor. An equation is found for phase discontinuity in the case of the Voigt effect. The second term in this formula accounts for combined transition and the third describes spin inversion. These formulas may be used to find conditions of resonance spin as a function of frequency.

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L 8979-66

ACC NR: AP5027429

Analysis of intraband Faraday and Voigt effects in lattice-type electric and magnetic fields shows that the forms of these expressions are invariant for simple bands.
Orig. art. has: 9 formulas.

SUB CODE: 20/

SUBM DATE: 17May65/

ORIG REF: 002/

OTH REF: 001

Card 2/2

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001858030002-4

APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001858030002-4"

URITSKIY, Z.I.

Category : USSR/Solid State Physics - Solid State Theory. Geometric E-2
Crystallography

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 3492

Author : Tolpygo, K.B., Uritskiy, Z.I.
Title : On the Theory of Polaron Mobility

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 5, 929-937

Abstract : The interaction of the translational motion of a polaron with the lattice vibrations and the associate energy loss of the polaron are investigated. The energy transferred from one polaron to the vibrational degrees of freedom of the lattice is calculated in a classical treatment. This type of excitation is possible for acoustic vibrations only if the polaron velocity exceeds the sound velocity in the crystal. It is thus analogous to the Cherenkov effect for an electron moving with a speed greater than light. The numerical results obtained for NaCl, KCl and KBr show that although this mechanism is not the main cause for slowing down, nevertheless the interaction of the current carriers with the acoustical and transverse optical vibrations is by no means small for these crystals.

Card : 1/1

57-28-5-3/36

AUTHORS:

Gurevich, L. E., Uritskiy, Z. I.

TITLE:

Absorption Coefficient Oscillations in Crystals in a Magnetic Field in the Range of the Internal Photoeffect (Otsillyatsii koeffitsiyenta pogloshcheniya kristallov v magnitnom pole v oblasti vnutrennego fotoeffekta)

PERIODICAL:

Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 5, pp. 932-935 (USSR)

ABSTRACT:

Tsverdlin and Leks (Ref 1) observed oscillations of the infrared absorption in strong magnetic fields in the range of the internal photoeffect. These oscillations can be conditioned by the quantization of the electron and hole states in a strong magnetic field. The authors investigated the theory of this phenomenon in the case, where the energy excess of the light quantum over the threshold of the photoeffect is considerably less than the width of the electron and hole zone. It is expedient here to employ the quadratic dependence of the carrier energy upon the momentum (if the zones are not in touch with each other). For the computation of the absorption coefficient the dispersion matrix for the interaction of photons with electrons and holes was applied. The electrons in the conduction band and the holes in the valence band were repre-

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Absorption Coefficient Oscillations in Crystals in a Magnetic Field in the Range of the Internal Photoeffect 57-28-5-3/36

sented by the Ψ operator:

$$\Psi(x) = \sum_{n, p_2, p_3} \left[a_{n, p_2, p_3} \Psi_{-n, p_2, p_3}(x) e^{-ik \cdot x_0 + b_{n, p_2, p_3}^+} \Psi_{+n, p_2, p_3}^* e^{i\epsilon + \nu_0} \right]$$

It follows from the theorem of energy conservation, that it is possible to sum in the first term with respect to n up to

$$n \leq \frac{\omega - \omega_0 - Q}{Q} - \frac{1}{2} \quad \text{and in the second term up to } n \leq \frac{\omega - \omega_0}{Q} - \frac{1}{2}$$

As n is an integer, the absorption coefficient apparently varies discontinuously in the case of equality. Because of the damping of the excitation states these discontinuities will actually be finite. The absorption coefficient appears to be anisotropic according to the orientation of K and H with respect to each other. The existence of oscillations at low values of n can be understood because of the fact, that each term in the sum is diminished with an increase of H as well as of ω . If H varies in the range $0 < n < 1$, a maximum exists in the vicinity of $Q \approx \frac{2}{3} (\omega - \omega_0)$. Finally the photoabsorption of im-

purity electrons is investigated in that case, where the con-

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Absorption Coefficient Oscillations in Crystals in a Magnetic Field in the Range of the Internal Photoeffect 57-28-5-3/36

centration of impurity is low and no impurity zone is formed. Under the assumption, that the electron is localized in the volume of an elementary cell, the impurity electron is represented by the Ψ - function:

$\Psi_{pr} = \frac{1}{V_0} D(\vec{x} - \vec{x}_i)$. It is possible to obtain the formula

$\alpha_{pr} = N_{pr} V_0$ for the absorption coefficient per unit length in the range of the impurity photoeffect, employing the interaction operator H given in formula (8). Thus the character of oscillations is in both cases the same. The magnitudes are proportional to the impurity concentrations and to the atom concentrations in the crystal. There are 3 references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physical-Technical Institute AS USSR). Gosudarstvennyy pedagogicheskiy institut im. A. I. Gertsena, Leningrad (State Pedagogic Institute imeni A. I. Gertsen, Leningrad)

SUBMITTED: January 24, 1978

1. Infrared spectra--Magnetic factors

001 2/2

URITSKIY, Z.I., Cond Phys-Math Sci — (diss) "On the theory
of long-wave absorption of crystals." Len, 1959. 9 pp
(Min of Education RSFSR. Len State Pedagogical Inst im A.I. Ger-
tsen. Chair of Theoretical Physics). 150 copies (K1,38-59, 114)

13

SOV/139-59-1-26/34

24(7), 24(3)

AUTHOR: Uritskiy, Z.I.

TITLE: On the Absorption of Crystals in a Strong Uniform Magnetic Field in the Region of the Internal Photoeffect (O pogloshchenii kristallov v sil'nom odnorodnom magnitnom pole v oblasti vnutrennogo fotoeffekta)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1959, Nr 1, pp 143-153 (USSR)

ABSTRACT: In a strong uniform magnetic field it is necessary to take into account the quantisation of the electron and hole states in crystals. The oscillation in the absorption by crystals, observed by Zwerdling and Lax (Ref 1), may be due to this quantisation. This suggestion is investigated quantitatively in the present paper. It is shown that the quantisation of the electron and hole states can in fact explain the above effect. A shift of the minimum of the energy band leads to the appearance (in a magnetic field) of absorption in a frequency range in which, in the absence of a magnetic field, absorption is only possible with phonon participation. The absorption coefficient turns out to depend on the angle between the direction of the magnetic field

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SOV/139-59-1-26/34

On the Absorption of Crystals in a Strong Uniform Magnetic Field
in the Region of the Internal Photoeffect

and the direction of propagation of the photon. The absorption coefficient is anisotropic because the effective mass tensor is anisotropic, depending on the orientation relative to the principal axes of the tensor, to the direction of the magnetic field and to the direction of the propagation of the photon. The work was directed by Professor L.E. Gurevich.

Card 2/2 There are 6 references, of which 1 is German, 1 is a translation from English, and 4 are English.

ASSOCIATION: Leningradskiy Pedinstitut imeni A.I. Gertsena
(Leningrad Pedagogical Institute imeni A.I. Gertsen)

SUBMITTED: May 26, 1958

24.7700

67320

SOV/181- 1-8-25/32

~~24(2)~~
AUTHORS:

Gurevich, L. E., Uritskiy, Z. I.

TITLE:

On the Theory of Long-wave Absorption by Crystals

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 8,
pp 1298 - 1301 (USSR)

ABSTRACT:

Long-wave radiation can be absorbed by crystals with frequencies $\omega < \omega_0$ (threshold of photoelectric effect) as well as in the range of the inner photoelectric effect. In the former case the following types of absorption are possible: a) direct by lattice vibrations, b) by formation of virtual excitations annihilated by phonon production, c) by free carriers, and d) by various types of excitons. The latter mechanism is not investigated in this paper. On the basis of papers by V. S. Mashkevich and K.B. Tolpygo (Ref 2), V. S. Mashkevich investigated resonance absorption by lattice vibrations. S. I. Pekar (Ref 3) pointed out a second type of absorption but did not calculate the absorption coefficient. The authors investigated absorption based on excitation of a virtual electron-hole pair by a quantum of light. This virtual pair is then annihilated to form one or several phonons. Calculations are carried out

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On the Theory of Long-wave Absorption by Crystals

according to the invariant perturbation theory with an operator being assigned to electrons and holes. Phonons and electrons of high energies predominate in absorption so that only an estimation of the order of magnitude of the dispersion coefficient is possible. This is done by linear dispersion approximation for acoustic phonons and square isotropic dispersion approximation for optical phonons and electrons. Absorption coefficients are studied for the following cases: one-phonon resonance absorption; the ratio of absorption coefficients is $\approx 10^{-3}$ in the case of production of i and $i - 1$ phonons. Absorption attains its maximum in the two-phonon process. Therefore, with frequencies equalling the sum of the maximum frequencies of any two branches, the absorption curve may exhibit singularities. The corresponding expression for κ_2 with $T \ll \Theta$ (Θ denotes Debye energy) is explicitly written down. The absorption coefficient κ_2 corresponding to a sharp resonance maximum is also written down. For impurity absorption $\kappa_{imp} \sim N \kappa_2$ holds, where N denotes the relative concentration of impurity states occupied by electrons. The authors investigate free-carrier absorption when a magnetic field is applied in the

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On the Theory of Long-wave Absorption by Crystals

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case of square isotropic carrier dispersion. The most essential point is the photon absorption by an electron together with emission or absorption of one phonon. The respective expressions for κ in the presence and absence of degeneration are written down. Zwerdling, Lax, Ye. F. Gross, B. P. Zakharchenya, and P. P. Pavinskiy (Ref 6) detected absorption coefficient oscillations in the region of the inner photoelectric effect; they may be explained by quantization of the electron- and hole states in the magnetic field. The corresponding general and fairly long expression for κ is written down. When electrons or holes are degenerate, the absorption edge is shifted according to polarization. There are 7 references, 6 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of Physics and Technology of the AS USSR). Pedagogicheskiy institut im. A. I. Gertsena, Leningrad (Pedagogical Institute imeni A. I. Gertsen, Leningrad)

SUBMITTED: April 21, 1959

Card 3/3

81643

S/181/60/002/06/32/050
B006/B056

24.3950

AUTHORS:

Gurevich, L. E., Uritskiy, Z. I.

TITLE:

The Theory of Infrared Absorption of Crystals

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1239 - 1249

TEXT: Longwave radiation can be absorbed in crystals, both if $\omega < E_0/\hbar$ (where E_0 denotes the width of the forbidden band) and within the internal photoeffect. In the present paper, the absorption of longwave radiation is investigated at frequencies $\omega < \omega_0$ (ω_0 - photoeffect threshold) and in the region of self-absorption. In this connection the absorption with the formation of virtual electron-hole pairs in the crystal (the pairs are annihilated under the formation of one or several phonons) is investigated, as well as absorption by free carriers in the homogeneous magnetic field and absorption in the magnetic field within the region of the internal photoeffect. In the first chapter of this paper, absorption in phonon production is studied. This so-called phononic absorption is investigated for atomic crystals. It is shown that photon absorption under the formation

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B006/B056

of two phonons is the most frequently observed both in the region of continuous absorption and in the resonance lines which are connected with the combination of phonons of different branches. This absorption coefficient (for the absorption on resonance lines) at frequencies which are equal to sums of cutoff frequencies of two arbitrary branches, is not a monotonic or smooth function of the frequency. In the second chapter, the absorption by free carriers in the magnetic field is investigated within the region of diamagnetic resonance ($\omega \gg \Omega$); it is shown that oscillations of the absorption coefficient occur with different periods and that, besides, the absorption coefficient has an anisotropy which depends on the orientation of the magnetic field with respect to photon polarization. The oscillations of the absorption coefficient occur both when degeneration exists and if there is no degeneration but if the magnetic field is strong ($\hbar\Omega \gg T$, Ω - Larmor frequency, T - temperature in energy units). In the region of self-absorption in a magnetic field, the oscillation of the absorption coefficient is obtained as a function of $(\omega - \omega_0)/\Omega$ with a period equal to unity. In the case of degeneration, the absorption edge shifts and oscillates as a result of Fermi level oscillation. Absorption

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The Theory of Infrared Absorption of Crystals

S/181/60/002/06/32/050
B006/B056

is hardly influenced by temperature. In the last part of the paper, which deals with absorption within the region of the internal photoeffect, it is shown that the shift of the absorption bands occurring in the case of electron or hole degeneration depends on the photon polarization relative to the magnetic field and has a step-like character at $e_{||} = 0$. Ye. P. Gross, B. P. Zakharchenya, P. P. Pavinskiy, V. S. Mashkevich, K. B. Tolpygo, S. I. Pekar, I. M. Livshits, and A. M. Kosevich are mentioned in the paper. There are 15 references: 6 Soviet, 7 American, 1 German, and 1 British.

ASSOCIATION: Fiziko-tekhnicheskiy institut (Physicotechnical Institute).
Pedagogicheskiy institut im. A. I. Gertsena, Leningrad
(Pedagogical Institute imeni A. I. Gertsen, Leningrad)

SUBMITTED: October 12, 1959

Card 3/3

24.7700(1043,1055,1164)

28100
S/181/61/003/009/034/039
B108/B138

AUTHORS: Baryshev, N. S., Uritskiy, Z. I.

TITLE: The theory of band-to-band impact recombination in semiconductors

PERIODICAL: Fizika tverdogo tela, w. 3, no. 9, 1961, 2861-2864.

TEXT: A recent publication by A. R. Beattie and R. T. Landsberg (Ref. 1: Proc. Roy. Soc., A 249, 1256, 1959) caused the authors of the present article to develop a more general theory on band-to-band impact recombination in semiconductors. With the substitutions $\mu = \frac{m_c}{m_v}$ and $k_g^2 = \frac{2m_c \Delta E_g}{\hbar^2}$ and

assuming a quadratic dispersion law, one obtains the following expressions for electron-electron and hole-hole collisions, respectively:

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B108/B138

4

The theory of band-to-band impact ...

$$x \equiv \left(\frac{t}{h} \right) |E_f - E_i| =$$

$$= \begin{cases} \left(\frac{t}{m_e} \right) \left[(k'_1 - k_1)(k'_1 - k_2) - \frac{1}{2}(1+\mu)k_1^2 - \frac{1}{2}k_2^2 \right], & (6a) \\ \left(\frac{t}{m_e} \right) \left[(k'_1 - k_1)(k'_1 - k_2) - \frac{1}{2}(1+\mu^{-1})k_1^2 - \frac{1}{2}\mu^{-1}k_2^2 \right] & (6b) \end{cases}$$

ΔE_g denotes the forbidden band width. The total recombination rate is equal to

$$R = 2^2 \sqrt{2} \pi^2 \frac{e^4 m_e^{3/2} (kT)^3}{V^2 h^3 \Delta E_g^{3/2}} \left[\frac{\Delta n}{a_e n_0} + \frac{\Delta p}{a_h p_0} \right] \left[2 \left(\frac{V}{8\pi^3} \right)^3 (AB)^3 \times \right. \\ \times \left[1 + \mu \exp \left(-\frac{E_g + E_g - 2F_0}{kT} - \frac{1-\mu}{1+\mu} \frac{\Delta E_g}{kT} \right) \right] \times \\ \times \exp \left[-\frac{7+9\mu}{6+6\mu} \frac{\Delta E_g}{kT} - \frac{E_g - F_0}{kT} \right]. \quad (9)$$

when electron exchange and screening effects are neglected in the electron and hole contributions to the recombination rate (Ref. 1). The constant AB is given by the expressions

Card 2/4

The theory of band-to-band impact ...

$$A = \int_0^{\Delta E_g} U_c^*(\mathbf{k}_c, \mathbf{r}) U_v(\mathbf{k}_v, \mathbf{r}) d\mathbf{r} + \frac{\Delta E_g}{m} \sum_{\substack{n \neq c, \\ n \neq v}} \frac{P_{cn}^* P_{nv}^s}{E_c - E_n}, \quad (4)$$

$$B = 1 + \frac{2\hbar^2}{m} \sum_{n \neq c} \frac{P_{cn}^* P_{nc}^s}{E_c - E_n} = \frac{m}{m_0}, \quad (5)$$

Notations: ϵ - dielectric constant, $P_{nn'} = \frac{(2\pi)^3}{\epsilon} \int U_n^*(\vec{r}) \left(\frac{\hbar}{i} \nabla \right) U_{n'}(\vec{r}) d\vec{r}$,

V - volume of the elementary cell, $\epsilon_{nn''} = \frac{E_n - E_{n''}}{\hbar}$, $U_n(\vec{r})$ - the Bloch factor, n and p deviation of the electron and hole concentrations from their equilibrium values n_0 and p_0 , respectively. F_0 is the Fermi level at equilibrium, $\epsilon_c \approx 2$ for non-degenerate semiconductors. The upper

limit of the excess-electron lifetime is given by $\tau_{el} = (tV) \frac{\epsilon n}{R}$, that of the excess-hole lifetime by $\tau_p = \frac{L}{n} \tau_n$. Semiconductors of the PbS group

Card 3/4

25100 S/181/61/003/009/034/039

The theory of band-to-band impact ... B108/B138

are considered as examples. The Landsberg and Beattie procedure (Ref. 1) is not applicable to this kind of substance as their (electron-to-hole effective mass ratio) is near unity. The electron and hole lifetimes are in this case:

$$\tau_n = \tau_p = \frac{\pi^3}{4\sqrt{2}} \frac{e^2 \hbar^6 n_i \Delta E_g^3}{e^4 m_e^3 (kT)^3 (AB)^2} \times \\ \times \exp \left[\frac{4}{3} \frac{\Delta E_g}{kT} + \frac{E_g - F_0}{kT} \right]. \quad (11)$$

The constant AB is found to be of the same order of magnitude as the forbidden to allowed band width ratio. Impact recombination in PbS and PbTe is much weaker than radiative recombination. In PbSe, however, impact recombination predominates at and above room temperature. There are 1 figure and 7 references: 1 Soviet and 5 non-Soviet.

SUBMITTED: April 10, 1961

Card 4/4

URITSKIY, Z.I.; ASADULLIN, Ya.Ya.

On the phonon theory of heat conduction. Izv. vys. ucheb. zav.;
fiz. no.5:89-91 '62. (MIRA 15:12)

1. Kazanskiy gosudarstvennyy universitet imeni"
V.I. Ul'yanova-Lenina.
(Heat—Conduction)

URITSKIY, Z.I.; IVANOV, Ye.N.

Theory of photoemission from semiconductors. Izv.vys.ucheb.
zav.;radiofiz. 5 no.1:197-199 '62. (MIRA 15:5)
(Semiconductors) (Photoelectricity)

URITSKIY, Z.I.; TULVINSKIY, V.B.

Contribution to the theory of the photoelectric emission of semiconductors with great depth of the yield of photoelectrons. Izv. vys. ucheb. zav.; radiofiz. 5 no.4:816-819 '62. (MIRA 16:7)

1. Kazanskiy gosudarstvennyy universitet.
(Semiconductors) (Photoelectricity)

24,2600

AUTHOR:
TITLE:

Uritskiy, Z.I.

The theory of the external photoelectric effect of
semiconductors with a large photoelectron work
function

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,
v.5, no.6, 1962, 1243-1245

TEXT: A model analogous to that of I.Ye. Tamm and
A.V. Shubnikov (Izys. Zs. d. S.U., v.68, 1931, 97) is considered.
The semiconductor is assumed to be infinite in the y and z
directions, and its thickness in the x -direction is taken to be
2 l . Using the Bethe-Sommerfeld expression for the probability
that a photon $\hbar\nu$ will be absorbed with the simultaneous creation
of a hole in the (k_x, k_y, k_z) state and an electron in the
 (k'_x, k'_y, k'_z) state, it is shown that the probability of finding
an electron with a momentum $\hbar\lambda$ outside the crystal is given by:

Card 1/3
PROVED FOR RELEASE

The theory of the external ...

S/141/62/005/006/022/023
E032/E114

$$W(\lambda) = \frac{e^2 E^2}{4\pi^2 m_0 \hbar^2} \int \frac{k_x^2 dk_x}{k_x^2 + k_y^2 - \lambda^2} - \frac{\lambda}{\lambda + k_x} \left[\frac{k_x^4 + \lambda k_x (k_y^2 - \lambda^2)}{(k_x^2 - k_y^2)^2} + \frac{(k_y^2 - \lambda^2)(k_x^2 - \lambda^2 - \lambda k_x')}{k_x^4} + 2 \frac{(k_x^2 - \lambda^2)(k_x^2 - \lambda k_x')}{k_x^2 (k_x^2 - k_y^2)} \right] \quad (5)$$

$$0 < \frac{\lambda^2 k_x^2}{2m_0} + \frac{\hbar^2 \lambda^2}{2m_0} < \hbar^2 - \Delta E - \varphi;$$

$$k_y^2 = \frac{2m_0}{\hbar} \varphi; \quad k_x^2 = \frac{2m_0}{\hbar^2} \frac{m_+ + m_-}{m_+ + m_0} \left[\varphi + \frac{\hbar^2 \lambda^2}{2m_0} - \frac{1 - m_-/m_0}{1 + m_-/m_+} \left(\hbar^2 - \Delta E - \frac{\hbar^2 k_x^2}{2m_+} \right) \right]$$

Card 2/5

The theory of the external ...

S/141/62/005/006/022/023
E032/E114

where: m_0 , m_- and m_+ are the mass of the free electron and effective mass of an electron and hole respectively; ΔE is the width of the forbidden band; E is the amplitude, $e\vec{\nu}$ is the polarisation unit vector of a light wave of frequency ν and φ is the discontinuity in the potential across the surface. Since W is independent of l , this result applies to a semiconductor of arbitrary thickness. Moreover, the presence of integration over the valence band suggests that the study of the external photoelectric effect will in this case provide information about the valence band and the conduction band separately. By varying ν and observing the photoelectric effect at constant λ it is possible to separate out the effect of the valence band alone. It follows that the presence of a strong magnetic field will lead to oscillations in the external photoelectric effect which, in distinction to the oscillations in the case of the internal photoelectric effect, may be related to the structure of the valence band or the structure of the conduction band alone.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova
Card 3/3 (State Optical Institute imeni S.I. Vavilov)
SUBMITTED: May 28, 1962

45631

S/141/62/005/006/022/023
E032/E114

24,2600

AUTHOR: Uritskiy, Z.I.

TITLE: The theory of the external photoelectric effect of
semiconductors with a large photoelectron work
function

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,
v.5, no.6, 1962, 1243-1245

TEXT: A model analogous to that of I.Ye. Tamm and
A.V. Shubnikov (Ihys. Zs. d. S.U., v.68, 1931, 97) is considered.
The semiconductor is assumed to be infinite in the y and z
directions, and its thickness in the x-direction is taken to be
2ℓ. Using the Bethe-Sommerfeld expression for the probability
that a photon $\hbar\omega$ will be absorbed with the simultaneous creation
of a hole in the (k_x, k_y, k_z) state and an electron in the
 (k'_x, k'_y, k'_z) state, it is shown that the probability of finding
an electron with a momentum $\hbar\lambda$ outside the crystal is given by:

Card 1/3

The theory of the external ...

S/141/62/005/006/022/023
E032/E114

$$W(k) = \frac{e^2 E^2}{4\pi^2 m_0 \hbar^2} \int \frac{k_x^2 dk_x}{k_x^2 + k_y^2 - \lambda^2} \frac{\lambda}{\lambda + k_x} \left[\frac{k_x^4 + \lambda k_x^2 (k_y^2 - \lambda^2)}{(k_y^2 - \lambda^2)^2} + \frac{(k_y^2 - \lambda^2)(k_y^2 - \lambda^2 - \lambda k_x)}{k_x^4} + 2 \frac{(k_y^2 - \lambda^2)(k_y^2 - \lambda k_x)}{k_x^2 (k_y^2 - \lambda^2)} \right]; \quad (5)$$

$$0 < \frac{\hbar^2 k_x^2}{2m_-} + \frac{\hbar^2 \lambda^2}{2m_0} < \hbar \nu - \Delta E - \varphi;$$

$$k_y^2 = \frac{2m_0}{\hbar^2} \varphi; \quad k_x^2 = \frac{2m_0}{\hbar^2} \frac{m_+ + m_-}{m_+ + m_0} \left[\varphi + \frac{\hbar^2 \lambda^2}{2m_0} - \frac{1 - m_-/m_0}{1 + m_-/m_+} \left(\hbar \nu - \Delta E - \frac{\hbar^2 k_x^2}{2m_+} \right) \right];$$

Card 2/3

The theory of the external ...

S/141/62/005/006/022/023
E032/E114

where: m_0 , m_- and m_+ are the mass of the free electron and effective mass of an electron and hole respectively, ΔE is the width of the forbidden band, E is the amplitude, $e\vec{\nu}$ is the polarisation unit vector of a light wave of frequency ν and φ is the discontinuity in the potential across the surface. Since W is independent of λ , this result applies to a semiconductor of arbitrary thickness. Moreover, the presence of integration over the valence band suggests that the study of the external photoelectric effect will in this case provide information about the valence band and the conduction band separately. By varying ν and observing the photoelectric effect at constant λ it is possible to separate out the effect of the valence band alone. It follows that the presence of a strong magnetic field will lead to oscillations in the external photoelectric effect which, in distinction to the oscillations in the case of the internal photoelectric effect, may be related to the structure of the valence band or the structure of the conduction band alone.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova
Card 3/3 (State Optical Institute imeni S.I. Vavilov)
SUBMITTED: May 28, 1962

14618

S/181/63/005/001/051/064
B108/B180

AUTHORS: Ikhsanov, R. N., and Uritskiy, Z. I.

TITLE: Theory of the production-recombination noise in semiconductors

PERIODICAL: Fizika tverdogo tela, v. 5, no. 1, 1963, 341-344

TEXT: F. M. Klaassen et al. (Physica, 26, 605, 1960) have already derived a general expression for the spectrum of the production-recombination noise. However, the correlation function was assumed in an incorrect form. Therefore the results of that paper are only correct for $\alpha_{k1}^{\dagger} = 0$, or where the additional condition

$$\sum_{k,l} [(c^{-1})_{kl} B_{lj} - (c^{-1})_{kl} B_{lk}] c_{kl} \frac{1}{1 + \omega_{kl}^2} = 0,$$

is imposed on the velocity of transition between the levels.

$B_{mn} = -p_{mn}^0 - p_{nm}^0$, the p are the velocities of the electron transition from one level to an other. From the kinetic equations, a system of Langevin equations is derived:

Card 1/3

Theory of the production- ...

S/181/63/005/001/051/064
B108/B180

$$\frac{d\Delta n_i}{dt} = \sum_{j=1}^i a_{ij} \Delta n_j + h_i(t), \quad (1),$$

$$a_{ij} = \sum_{k=1}^{i+1} \left[\left(\frac{\partial p_{ik}}{\partial n_j} \right)_0 - \left(\frac{\partial p_{ik}}{\partial n_j} \right)_0 \right], \quad (2),$$

$$\Delta n_j = n_j(t) - \langle n_j \rangle.$$

n_i is the number of electrons in the i -th level.

$$\Delta Z_k = \sum_{i=1}^i c_{ki} \Delta n_i, \quad (4),$$

$$\sum_{i=1}^i c_{ii} a_{ij} = -\frac{1}{\tau_i} c_{ij}, \quad (5).$$

Card 2/3

Theory of the production....

S/181/63/005/001/051/064
B108/B180

The time constants τ_i are determined by the equation

$|a_{ij} + \frac{1}{\tau} \delta_{ij}| = 0$. Correct results are obtained if a correlation function of the form $\langle h_i(t)h_j(t') \rangle = \langle h_i h_j \rangle \delta(t - t')$ is used. $\delta(t - t')$ is the Dirac δ -function, $\langle h_i h_j \rangle$ is a constant proportional to the spectral density.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S. I. Vavilova,
Leningrad (State Optical Institute imeni S. I. Vavilov,
Leningrad)

SUBMITTED: March 10, 1962 (initially)
August 10, 1962 (after revision)

Card 3/3

BARYSHEV, N.S.; URITSKIY, Z.I.

On the theory of impact recombination in semiconductors
with an impurity band. Fiz. tver. tela 5 no.2:478-480 F '63.
(MIRA 16:5)

1. Gosudarstvennyy opticheskiy institut imeni S.I.Vavilova,
Leningrad.
(Semiconductors) (Wave mechanics)

ACCESSION NR: AP4036555

S/0139/64/000/002/0023/0027

AUTHOR: Kolesnikov, A. A.; Uritskiy, Z. I.

TITLE: Possible generation of negative temperature in a doped semiconductor under pulsed excitation

SOURCE: IVUZ. Fizika, no. 2, 1964, 23-27

TOPIC TAGS: semiconductor, semiconductor laser, negative temperature, semiconductor excitation, pulsed excitation

ABSTRACT: The study described developed from previous research by the authors (A. A. Kolesnikov, Z. I. Uritskiy. Izv. vuzov SSSR, Fizika, No. 2, 171, 1964). In the present investigation, the semiconductor is excited by pulses of light with wavelength greater than the width of the forbidden zone into which the impurity center yields two acceptor levels. The pulse duration τ_1 and the interval between pulses τ_2 must be such as to allow for the population inversion between levels in a semiconductor during τ_2 . The states with negative temperature correspond to an instant when the pulse is switched off and the population of the upper level exceeds that of the lower. The computed or experimental values of the kinetic transition factor

Card 1/2

ACCESSION NR: AP4036555

and the probability of elementary radiative transition can be used to derive the necessary length and height of a pulse and the duration between pulses for which a state with negative temperature between the impurity levels is generated. Orig. art. has: 9 formulas.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S. I. Vavilova (State Optical Institute)

SUBMITTED: 24Dec62

ATD PRESS: 3045

ENCL: 00

SUB CODE: XC

NO REF SOV: 003

OTHER: 000

Card 2/2

KOLESHNIKOV, A.A.; URITSKIY, Z.I.

Possible appearance of negative temperatures in impurity semiconductors. Izv. vys. ucheb. zav.; fiz. no. 2:171-173 '64.
(MIRA 17:6)

1. Gosudarstvennyy opticheskiy institut imeni Vavilova.

ACCESSION NR: AP5019231

17/0056/65/0001/00182/0187

AUTHOR: Uralskiy, E. I., Shustov, G. V.

TITLE: Use of Green's function in the theory of optical properties of semiconductors

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 182-187

TOPIC TAGS: Green function, optical property, absorption, dispersion, line shape, semiconductor

ABSTRACT: The authors consider the application of the Green's function method to the theory of the dispersion and absorption of electromagnetic radiation in semiconductors, and also to the theory of resonance-line shape. The advantage claimed for this method (over the approach involving current density and conductivity) is that it permits a simple determination, by means of a unified scheme, of the line shape in the case of resonance absorption, since the damping of the quasiparticles that absorb the photon is also included in the imaginary part of the spectrum in accordance with a definite rule. Expressions are obtained in closed form for the optical constants and the line

Card 1/2

L 63102-00

ACCESSION NR: AP5019231

shape, by finding the energy spectrum of the photons. The method developed is applied to the theory of the line shape of magneto-optic resonance and to the theory of the absorption of radiation by free carriers. It is shown that in a quantizing magnetic field resonance oscillations can occur in scattering both by optical and acoustical phonons. Orig. art. has ... formulas.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet (Ural State University)

SUBMITTED: 18Dec64

ENCL: 00

SUB CODE: SS, OF

NO REF SOV: 004

OTHER: 004

ATD PRESS: 4074

Card 2/2

SIROTA, D.; URITSKIY, Z.; SHUSTER, G.

Theory of the diamagnetism of semiconductors in a quantized magnetic field. Pis'. v red. Zhur. eksper. i teor. fiz. 1 no.5:1-5 Je '65. (MIRA 18:11)

1. Ural'skiy gosudarstvennyy universitet imeni Gor'kogo.
Submitted April 14, 1965.

L 20404-66 IJP(c) AT
ACC NR: AP5024750

SOURCE CODE: GE/0030/65/011/002/0553/0556

AUTHOR: Uritsky, Z. I.; Pervushin, Yu. V.

44
B

ORG: Ural State University, Sverdlovsk

TITLE: Effect of steady state illumination on the ²¹electron distribution function in semiconductors

SOURCE: Physica status solidi, v. 11, no. 2, 1965, 553-556

TOPIC TAGS: semiconductor, photoconductor, photoconductivity, electron distribution, distribution function, photocurrent

ABSTRACT: The effect of steady state illumination on the distribution function of the photo-excited current carriers is considered. It is shown that the energy of the distribution function may be non-monotonic. This may essentially determine the spectral characteristics of the photocurrent. The dependence of the photocurrent on the optical frequency near the absorption edge may differ from the corresponding dependence of the absorption constant. It is shown that the oscillations of photoconductivity with optical frequency

2

Card 1/2

L 20404-66

ACC NR: AP5024750

at low temperatures may be due to this dependence of the distribution functions on the nature of the incident light. Orig. art. has: 15 formulas.

SUB CODE: 20,09/
OTH REF: 003/

SUBM DATE: 25May65/

SOV REF: 001/

Card 2/2 *BK*

L 22628-66 T/ENA(h) IJP(c) AT
ACC NR: AP6002049 SOURCE CODE: GE/0030/65/012/002/K101/K104

AUTHOR: Uritsky, E. I.; Shuster, G. V.

ORG: Ural State University, Sverdlovsk

TITLE: Effect of ^{21, 44, 55}spin magnetophonon interaction on the ^{21, 44, 55}light absorption in ^{21, 44, 55}semi-conductors

SOURCE: Physica status solidi, v. 12, no. 2, 1965, K101-K104

TOPIC TAGS: magnetic field, magnetophonon, phonon, phonon interaction, ~~acoustical~~ ~~phonon~~, ~~acoustical~~ ~~phonon~~, photon, light absorption, semiconducting material

ABSTRACT: In an earlier study (Zh. eksper. teor. fiz. 49, 182, 1965) the authors have shown that the interaction with phonons in quantum magnetic fields leads to new resonance effects. The present paper deals with transitions involving spin inversions of electrons due to interaction with acoustical phonons, optical phonons, and photons producing additional resonance peaks in the absorption. Mathematical expressions for spin inversion by photons, acoustical phonons and optical phonons are proposed. It is shown that spin inversion is mainly caused by transversal acoustical phonons, and a mathematical expression is given to describe it. A formula is also suggested to describe the spin inversion of an electron by a photon of polarization and interaction with acoustical and optical phonons. When the resonance condition $\Delta = 0$ is realized, the absorption index has a logarithmic

Card 1/2

L 22628-66

ACC NR: AP6002049

singularity. The form of resonance peaks is determined by damping of carrier states. According to the authors, spin inversion induced by optical phonons does not result in resonance oscillations of the absorption index. Orig. art. has: 3 formulas.[LD]

SUB CODE: 20/ SUBM DATE: 28Oct65/ ORIG REF: 004/ OTH REF: 002/

Card

2/2 ULR

L 22629-66 T/EWA(h) IJP(c) AT

ACC NR: AP6002050

SOURCE CODE: GE/0030/65/012/002/K105/K108

AUTHOR: Uritsky, E. I. Sirota, D. I.

ORG: Ural State University, Sverdlovsk

TITLE: Effect of spin-magnetophonon interaction in the magnetic susceptibility
in semiconductors

SOURCE: Physica status solidi, v. 12, no. 2, 1965, K105-K108

TOPIC TAGS: magnetophonon, ~~quantum~~ magnetic field, magnetic susceptibility, carrier scattering, ~~semiconductor~~, ~~optical~~ phonon, spin inversion, resonance scattering, ~~semiconducting material~~

ABSTRACT: It was shown in previous studies (D. I. Sirota, S. I. Uritsky, and G. V. Shuster, Zh. eksper. teor. Fiz., Pisma Red. 1, No. 5 (1965); S. I. Uritsky and G. V. Shuster, Zh. eksper. teor. Fiz. 49, 182 (1965)) that resonance scattering of current carriers in semiconductors by optical phonons in quantum magnetic fields leads to singularities in the energy spectrum of the carrier which are reflected by resonance oscillations of the thermodynamic functions and of the magnetic susceptibility. It was also found (S. T. Pavlov and Yu. A. Firsov, Fiz. tverd. Tela 7, 2634 (1965); I. M. Tsidilkovski, M. I. Akselrod, and S. I. Uritsky, phys. stat. sol., in press) that carrier scattering by optical phonons with spin inversion is of a resonance nature. In the present paper the authors consider the effect of this mechanism on the magnetic susceptibility of current carrier. A mathematical defi-

Card 1/2

L 22622-66

ACC NR: AP6002050

tion of the effect of carrier-phonon interaction on the thermodynamic potential is proposed and the calculation of the matrix elements of the operator and the operators of the current carrier and phonon fields is given. The authors confirm that the magnetic susceptibility has a resonance peak whose position can be used to determine the value of the g-factor. Orig. art. has: 9 formulas. [LD]

SUB CODE: 20/ SUBM DATE: 02Nov65/ ORIG REF: 004/ OTH REF: 002/

Card

2/2

L 46935-66 EWT(1) I:-(c) WW/GO

ACC NR: AP6015495

SOURCE CODE: UR/0181/66/008/005/1621/1622

AUTHOR: Uritskiy, Z. I.; Shuster, G. V.; Kozinskaya, A. I.

ORG: Ural State University im. A. M. Gor'kiy, Sverdlovsk (Ural'skiy gosudarstvennyy universitet)

TITLE: On the theory of ^{2/}light absorption by carriers in a ^{2/}quantized magnetic field

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1621-1622

TOPIC TAGS: light absorption, carrier scattering, resonance scattering, cyclotron resonance

ABSTRACT: An expression for the light absorption coefficient is developed for the case where the principal scattering mechanism is the scattering of the current carriers on an ionized admixture, which apparently takes place at low temperatures. It appears that the coefficient of radiation absorption in a quantized magnetic field has resonance peaks when $\omega_k = \omega_0 n$, where ω_k is the photon frequency. When $n=1$, the resonance coincides with the cyclotron resonance. It follows that the cyclotron resonance line cannot be determined by this type of scattering. This confirms a previously derived conclusion for the case where the scattering takes place on phonons. Orig. art. has: 3 formulas.

SUB CODE: 20/

SUBM DATE: 29Nov65/

ORIG REF: 002

Card 1/1 *all in*

L 10914-66 EWT(1)/EWP(t)/EWP(b) IJP(c) JD/WH/GG

ACC NR: AP6002037

SOURCE CODE: GE/0030/65/012/002/0667/0678

AUTHOR: Tsidilkovskii, I. M.; Akselrod, M. M.; Uritsky, S. I.

ORG: Tsidilkovskii, Akselrod / Institute of Metal Physics, Sverdlovsk / Tsidilkovskii, Uritsky / Ural State University

TITLE: Spin-magnetophonon resonance in semiconductors

SOURCE: Physica status solidi, v. 12, no. 2, 1965, 667-678

TOPIC TAGS: semiconductor, magnetoresistance, phonon, conduction electron, *electron spin, electron interaction, semiconducting materials*

ABSTRACT: A theory of spin-magnetophonon resonance is presented. The spin interaction of electrons with optical phonons is described by the introduction of vector and scalar potentials of the optical vibrational field. It is shown that the spin-magnetophonon resonance should cause a minimum in the longitudinal magnetoresistance. The experimental data for n-InSb and N-InAs are discussed on the basis of this theory. In experiments conducted on N-InSb, a maximum transverse magnetoresistance was observed at 82 kg. This peak corresponds to the spin-magnetophonon resonance. The g-factor for the conduction electrons calculated from this maximum is in good agreement with the theoretical value. A minimum in the longitudinal magnetoresistance observed at 24 kg was attributed to the combined magnetophonon and spin-magnetophonon resonance scattering. Orig. art. has: 17 formulas and 3 figures. [CS]

SUB CODE: 20 / SUBM DATE: 05Jul65/ ORIG REF: 004/ OTH REF: 008/ ATD PRESS:

Card 1/1

4170

ACC NR: AP6026387

(A)

SOURCE CODE: GE/0030/66/015/001/K005/K007

AUTHOR: Uritsky, S. I.; Bikkin, H. M.

ORG: Ural State University, Sverdlovsk

TITLE: Charge carrier light absorption in semiconductors in crossed fields

SOURCE: Physica status solidi, v. 15, no. 1, 1966, K5-K7

TOPIC TAGS: semiconductor theory, current carrier, exciton absorption, phonon scattering, phonon spectrum

ABSTRACT: An expression for the absorption coefficient in the case of free carrier absorption with an electric field (E) perpendicular to the quantum magnetic field (H) is analyzed. The analysis showed that for $E = 0$ phonon dispersion may account for the resonant peak in the absorption coefficient and the resonant peak should be a log function of temperature T . If E is weak, the coefficient is only slightly dependent on E . For strong E , the coefficient decreases as $E^{1/2}$ and increases as $H^{1/4}$ and $T^{1/2}$. Similar results would hold in the case of scattering by optical phonons, but the background of the absorption coefficient would be different. Orig. art. has: 5 formulas.

SUB CODE: 20/

SUBM DATE: 18Mar66/

ORIG REF: 005

Card 1/1

BC

Preparation of filter-plates. V. N. Urinsev and
M. B. Usovskiy (J. Chem. Ind. Russ., 1933, No. 3,
57-58). Secondary filter-plates are prepared by
heating quartz sand at 200-220° under pressure with
oxalic carbonic acid, formic acid, and $(\text{CH}_3)_2\text{N}_2$. R. T.

BI

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

MURIZKO, M. I.

Physicochemical properties of solutions in liquefied gases. XIX. Acid-base indicators in liquid sulfur dioxide. A. I. Shatenshteyn and M. I. Ushko. *J. Phys. Chem.* (U. S. S. R.) 10, 766-76 (1917).—*See C. A.* 12, 2412. Also cf. *C. A.* 11, 3075. XX. Titration of solutions in liquid ammonia at room temperature. A. I. Shatenshteyn. *Ibid.* 777-81.—*See C. A.* 12, 4007. XXI. Liquid sulfur dioxide as a solvent for inorganic substances. A. I. Shatenshteyn and M. M. Viktorov. *Ibid.* 11, 10-17 (1908).—*See C. A.* 11, 7911. R. J. C.

ASB-51.4 METALLURGICAL LITERATURE CLASSIFICATION

KORCHAGIN, B. V.; URIZKO, M. I.

Dnepropetrovsk

Laboratory of Physical Chemistry, Chemico-Technological Institute, (-1940-).

"The Reaction of the Change of Hydrogen into Deuterium in Heterogenous Systems".

Zhur. Fiz. Khim., Vol. 14, No. 12, 1940.

URIZKO V!

The catalytic oxidation of ammonia. L. V. Polyakov,
V. I. Urizko, and N. F. Gakuka (L. V. Pivarshevskii Inst.
Phys. Chem., Acad. Sci. Ukr. S.S.R., Kiev) Zhur. Fiz.
Khim. 25, 1469 (1951). The yield of
nitric acid from ammonia on Pt
catalyst was 100% at 400°C.
The reaction was studied in
the range of 300-500°C.
The reaction was studied in
the range of 300-500°C.

CA

18

The optimum conditions in the catalytic oxidation of ammonia. M. V. Polyakov, V. I. Lelko, and N. P. Galenko (L. V. Pisarzhevskii Phys.-Chem. Inst., Acad. Sci. Ukr. S.S.R.) *Doklady Akad. Nauk S.S.S.R.* 77, 838-7(1961). — The facts that the optimum temp. and contact time for the production of NO, and the slopes of the contact time as a function of temp., depend on the dimensions of the quartz vessel, and that the notoriously very slow decompn. of NO cannot be responsible for the defixation of NH_3 to N_2 under nonoptimum conditions, point to the conclusion that the defixation is due to decompn. of NH_3 on the quartz wall prior to its contact with the catalyst. This conclusion is corroborated by detns. of the degree of decompn. of NH_3 in mist with N_2 (8% NH_3), in quartz vessels free from Pt sputtered on the wall; the increase of the degree of decompn. with the temp. between 600 and 900° is very much faster with a rate of flow of 0.5 than with 2 l./min., e.g., at 800°, the de-

compu. of NH_3 attains 14 and 7.5%, resp. The decompn. of NH_3 is even faster in mist. with air (8% NH_3). As a function of the temp., the degree of decompn. is linear, and the slope decreases with increasing rate of flow (0.5, 2, and 4 l./min.); at each temp. (600, 700, and 800°), the degree of decompn. decreases with increasing rate of flow. At the const. rate of flow of 1 l./min., the degree of decompn. of NH_3 reaches a max. at 800°, and then falls between 800 and 900°. Admixt. of 0.1% H_2S in the gas, in the absence of catalyst, lowers the decompn. of NH_3 on the quartz wall; in the presence of catalyst, the same admixt. increases the yield of NO, generally by 5-6% and up to 20-30%. This is understandable if it is assumed that H_2S poisons the wall of the vessel and thus prevents decompn. of NH_3 prior to its contact with the catalyst. The lowering of the premature decompn., and the increase of the yield of NO in the presence of H_2S , are more marked the larger the diam. of the vessel. The decompn. of NH_3 at the wall is of the heterogeneous type. The main process of oxidation of NH_3 proper involves no actually optimum conditions of temp. and contact time, and no actual linear relationship between these conditions.

N. Thon

1951

URIZKO, V.I.; POLYAKOV, M.V.

~~Investigation of the kinetics of oxidation of methane in formalde-~~
hyde. Dop. AN URSS no. 6:397-399 '53. (MLRA 7:1)

1. Institut fizichnoi khimii im. L.V. Pisarzhevs'kogo Akademii nauk
Ukrains'koi RSR. Predstaviv diysnyi chlen Akademii nauk Ukrains'koi
RSR O.I. Brods'kiy. (Methane) (Formaldehyde) (Oxidation)

URIZKO, V. I.

"Investigating the Kinetics and Mechanism of Methane Oxidation."
Cand Chem Sci, Inst of Physical Chemistry Acad Sci Ukrainian SSR,
Kiev, 1954. (KL, No 9, Feb 55)

SO: Sum. No. 631, 26 Aug 55-Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institu-
tions (14)

URIZKO, V. I.

USSR/Physical Chemistry

Card 1/1

Authors : Urizko, V. I. and Polyakov, M. V.

Title : Effect of wall surfaces on oxidation of methane into formaldehyde.

Periodical : Dokl. AN SSSR 95, 6, 1239 - 1241, 21 Apr 1954

Abstract : Effect of wall surfaces on the kinetics of methane transformation into formaldehyde has been investigated experimentally, by the method of a divided calorimeter. A part of the experimental data is given in the article. Diagrams.

Institution : L. V. Pisarevskiy's Inst. of Phys. Chem. of the Acad. of Scs. of UK.SSSR.

Submitted : 17 Feb 1954

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001858030002-4

APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R001858030002-4"

URIZKO, V.I.; POLYAKOV, M.V.

Effect of nitrogen oxides on the oxidation of methane. Ukr.khim.
zhur. 22 no.6:713-719 '56. (MLRA 10:7)

1. Institut fizicheskoy khimii im. L.V. Pisarshevskogo AN USSR.
(Methane) (Nitrogen oxides) (Oxidation)

URIZKO, V.I.; POLYAKOV, M.V.

Effect of potassium borate on the oxidation of methane. Ukr. khim.
zhur. 24 no. 2:177-181 '58. (MIRA 11:6)

1. Institut fizicheskoy khimii im. L.V.Pisarzhhevskogo AN USSR.
(Methane)
(Oxidation)
(Potassium borate)

GVOZDETSKIY, N.A., prof.; ZHUCHKOVA, V.K., dots.; ALISOV, B.P., prof.;
VASIL'YEVA, I.V., dots.; VARLAMOVA, M.N., tekhnik-kartograf;
DOLGOVA, L.S., dots.; ZVORYKIN, K.V., st. nauchnyy sotr.;
ZEMTSOVA, A.I., assistant; IVANOVA, T.N.; LEBEDEV, N.P., st.
prepodavatel'; LYUBUSHKINA, S.G.; NESMEYANOVA, G.Ya., mlad.
nauchnyy sotr.; PASHKANG, K.V., st. prepod.; POLTARAUS, B.V.,
dots.; RYCHAGOV, G.I., st. prepod.; SPIRIDONOV, A.I., dots.;
SMIRNOVA, Ye.D., mlad. nauchnyy sotr.; SOLNTSEV, N.A., dots.;
FEDOROVA, I.S., mlad. nauchnyy sotr.; TSESEL'CHUK, Yu.N.,
mlad. nauchnyy sotr.; SHOST'INA, A.A., mlad. nauchnyy sotr.;
Prinimali uchastiye: BELOUSOVA, N.I.; GOLOVINA, N.N.;
KALASHNIKOVA, V.I.; KOZLOVA, L.V.; KARTASHOVA, T.N.;
PAN'KOVA, L.I.; URKIKHO, V.; PETROVA, K.A., red.; LOPATINA,
L.I., red.; YERMAKOV, M.S., tekhn. red.

[Physicogeographical regionalization of the non-Chernozem
center] Fiziko-geograficheskoe raionirovanie nechernozemnogo
tsentra. Pod red. N.A.Gvozdetskogo i V.K.Zhuchkovoi. Moskva,
Izd-vo Mosk. univ., 1963. 450 p. (MIRA 16:5)
(Physical geography)

BC

a-4

Symptoms of changes in pathogenesis of leukodystrophies during testing in low-atmospheric chamber and on high-atmospheric flight.
A. D. G. Mikhov (J. Med. Ukraine, 1960, No. 1088-1044).
Pathological changes were found in the nasal sinuses in animals suddenly subjected to low atm. pressures in a chamber.
M. K.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNOPTIC

SYNOPSIS

RELATIONS

FROM DONOR

RELIST ON GNY 101

URKS, M.; CHERKES, L.D.; SEVERA, Z.

Improvement in the filtration of culture fluid in the production of
antibiotics from Actinomyces. Med.prom. 14 no.11:21-27 N '60.
(MIRA 13:11)

1. Nauchno-issledovatel'skiy institut antibiotikov, Chekhoslovatskaya
Sotsialisticheskaya Respublika.

(ANTIBIOTICS)

(ACTINOMYCES)

BULANT, V.; GORSKI, O. [Horsky, O.]; URKS, M. [Urkh, M.]

Chromatography of 6-azauracil and its derivatives. Antibiotiki 10
no.2:99-104 F '65. (MIRA 18:5)

1. Nauchno-issledovitel'skiy institut antibiotikov, Chekhoslovakiya,
Roztoki u Pragi.

URKUNOV, A.

One million health resort guests. Mest.prom.i khud.promys.
3 no.2:30 F '62. (MIRA 15:2)

1. Nachal'nik upravleniya mestnoy promyshlennosti, Sochi.
(Sochi—Service industries)

URLANG, F. D.

33114

Issledovaniye Protsessa Sgoraniya Generatornogo Gaza V Kamerakh Sgoraniya Gazovykh Turbin. Trudy Tsentr. Nauch.-Issled. In-Ta Rech. Flota, Vyp. 4, 1949, c. 109-36.

SO: Letopis' Zhurnal'nykh Statey, Vol. 45, Moskva, 1949

URLANG, F.D.

STRUBINSKIY, S.S., URLANG, F.D.

Automatic protection and signalling in 3D6 engines. Trudy TSMIIN
no. 23 '53. (MLRA 8:3)
(Marine engines)(Automatic control)

URIANG, F.D., kandidat tekhnicheskikh nauk.

Choice of engine types for river vessels. Rech.transp. 15 no.5:
12-16 My '56. (MLRA 9:8)

(Marine engines)

URLANG, F.D., kand.tekhn.nauk; SHUSHKIN, V.N., kand.tekhn.nauk

Testing the new "OT-801" pusher tug. Rech.transp. 18 no.5:27-30
My '59. (MIRA 12:9)

(Tugboats)

URLANG, F.D., kand. tekhn. nauk, inzh.; RENSKIY, N.M., otv. za vypusk;
MAKRUSHINA, A.N., red. izd-va; BODROVA, V.A., tekhn. red.

[Manual for the operation of 18D engines] Rukovodstvo po ekspluatatsii
dvigatelei 18D. Moskva, Izd-vo "Rechnoi transport," 1961. 110 p.
(MIRA 14:9)

1. Russia (1917- R.S.F.S.R.) Ministerstvo rechnogo flota. 2. Otdel
teplosilovykh ustanovok Tsentral'nogo proyektno-konstruktorskogo i
tekhnologicheskogo byuro (for Urlang).
(Marine diesel engines)

URLANG, F.D., kand.tekhn.nauk

Performance curves of 6ChSP 18/22 diesel engines. Trudy LIT
no.18:6-14 '61. (MIRA 14:9)

(Marine diesel engines--Testing)

URLANG, F., kand.tekhn.nauk

Efficiency of introducing complete automatization of passenger
ship power plants. Rech. transp. 20 no.5:24-26 My '61.
(MIRA 14:5)

(Marine engineering)

(Automatic control)

RENSKIY, Nikolay Mikhaylovich, BRYKOV, S.K., kand. tekhn. nauk,
retsenzent; GLADYSHEV, V.F., inzh., retsenzent; URLANG,
F.D., kand. tekhn. nauk, red.; KAN, P.M., red. ~~izd-va~~;
RIDNAYA, I.V., tekhn. red.

[Operation of principal engines of serially manufactured
diesel river boats] Ekspluatatsiia glavnykh dvigatelei se-
riinykh teplokhodov. Moskva, Izd-vo "Rechnoi transport,"
1963. 119 p. (MIRA 17:4)

IKONNIKOV, Sergey Alekseyevich, dots., kand. tekhn. nauk; URLANG, Foma Davydovich, dots., kand. tekhn. nauk; LAKHANIN, V.V., prof., doktor tekhn.nauk, retsenzent; REZNIKOV, E.G., inzh., retsenzent; LEONT'YEVSKIY, Ye.S., nauchm. red.; SHLENNIKOVA, Z.V., red.izd-va; BODROVA, V.A., tekhn. red.

[Design of marine power plants (for the merchant marine)]
Proektirovanie sudovykh silovykh ustanovok (transportnogo flota). Moskva, Izd-vo "Rechnoi transport," 1963. 383 p.
(MIRA 16:12)

1. Gor'kovskiy institut inzhenerov vodnogo transporta (for Ikonnikov). Leninskiy institut vodnogo transporta (for Urlang).

(Marine engineering)

URLANG, F., kand. tekhn. nauk

Marine diesel engine with gas turbine pressure charging.

Rech. transp. 22 no.10:29-31 0 '63.

(MIRA 16:12)

URLANG, F.D., kand. tekhn. nauk, dotsent

Outlook for the use of locomotive diesels on river vessels.
Trudy LIVT no.72:5-17 '64. (MIRA 18:10)

L 27505-66 EWT(d)/EWT(m)/EWP(f)/T WE

ACC NR: AT6004449

(N)

SOURCE CODE: UR/3188/64/000/072/0005/0017

AUTHOR: Urlang, F. D. (Candidate of technical sciences, Docent)

ORG: LIVT

TITLE: Prospective application of locomotive type diesels to the river ships of merchant marine

SOURCE: Leningrad. Institut vodnogo transporta. Trudy, no. 72, 1964. Sudovyye silovyye ustanovki (Marine power plants), 5-17

TOPIC TAGS: shipbuilding engineering, diesel engine, marine engineering/
6ChNSP25-34 diesel engine, 8ChNSP25-34 diesel engine, 6ChRN36-45 diesel engine

ABSTRACT: A general review of diesel engines of locomotive type and of their eventual use for propulsion of river motorships is presented. In general, it is proposed to use for large river craft low-speed diesels of the three following types: 6ChNSP25/34, 8ChNSP25/34 and 6ChRN36/45. They operate on DT-1 fuel with a 100 pct gas-turbine supercharging system. The series production of the first two types will start after 1967 while the third type was already produced and ready for delivery in 1965. The possibility of using large high-speed compression-ignition engines (600 to 4000 hp, 750 to 1000 rpm, 13 to 20 kg/sq cm) for river craft was also investigated. The studies showed that the high-speed propulsion could be realized only by adopting high-power and light-

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weight locomotive diesels. Some modifications of their operating characteristics were recommended. Comparative data on various types of low-speed and locomotive diesel units were given in two extensive tables covering their types, horse-power, shaft number, engine and equipment weights, number of operation days, electric generators, fuel, lubricants and the size of engine rooms. In general, the weight of locomotive diesel units was from 10 to 20% less than that of low-speed units. It was also shown that the size of engines rooms changed little with the types of the main diesel. Operation time, as well as the time needed for maintenance repairs and general overhaul were also tabulated for different types of diesels. The economics of diesel power was discussed and the results of estimates (in rubles) were presented in two tables including the costs of construction, operation, repairs, depreciation, etc. The estimates showed that the ship construction costs were from 3 to 8% lower for diesels of locomotive type. The installation of locomotive diesel units was from 6.5 to 15.3% cheaper than the installation of low-speed engines. The repair costs were also lower (from 13 to 25% for large engines over 2400 hp). The economics of fuel oil was also examined and the advantage of using DT-1 fuel for low-speed diesels was stressed. In conclusion, it was recommended to use locomotive diesels instead of low-speed diesels of ChNSP25/34 type on all river craft. The replacement of 6ChRN was also recommended for high-power tugs, pushers and high-speed ships. Orig. art. has: 4 graphs and 5 tables.

SUB CODE: 13 / SUBM DATE: None / ORIG REF: 000 / OTH REF: 000

Card 2/2 BLG

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URLANIS, BORIS TSEZAREVICH

Statisticheskiye Metody Izucheniya Zavisimosti Yavleniy (Statistical
Methods of Study of the Relation of Effects) Moskva, Gosstatizdat, 1956.
109 p. graphs, tables. Bibliographical footnotes.

URLANIS, B

AUTHOR: Urlanis, B.

2-3-12/14

TITLE: A.G. Rashin, The Population of Russia for 100 Years (1811-1913). Statistical sketches. Edited by Academician S.G. Strumilin. Gosstatizdat, 1956, 351 pages (A.S. Rashin, Naseleniye Rossii za 100 let (1811-1913 gg).- Statisticheskiye ocherki. Pod red. akad. S.G. Strumilina, Gosstatizdat, 1956, 351 str.)

PERIODICAL: Vestnik Statistiki, 1957, No 3, May-June, pp 83-85 (USSR)

ABSTRACT: This article is a critical review of the book named in the title. The book is welcomed, as there is hardly any information of this kind. The results of the 1926 census are published in 56 volumes, but they do not contain any monography with scientific comment. There is a book by Ye.Z. Volkov, "Dynamics of USSR Population for 80 years", edited in 1930, but this author focused his attention on the period between 1914 and 1917 and, in general, this book cannot serve as a sufficiently reliable source. Rashin's book consists of four parts: the 1st treats the dynamics of the whole population number and the territorial distribution; the 2nd treats the urban population; the 3rd - the natural development of population; the 4th - the composition by sex and age, literacy and the social composition of the population of large towns.

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2-3-12/14

A.G. Rashin, The Population of Russia for 100 Years (1811-1913). Statistical sketches. Edited by Academician S.G. Strumilin. Gosstatizdat, 1956, 351 pages

It is regretted that the author pays comparatively little attention to the natural developments before 1861, the time of the agrarian reform. The period 1861-1913 is analysed in detail and the book contains coefficients of birth for every of the 50 districts (guberniyas) of European Russia. It can be seen that the birth rate declined an average 13%, but the figures are very different in different regions. For instance, in Astrakhan', (Don Cossacks Region) there was even an increase of births, while in west regions the birth rate took an abrupt 44% decrease, (Lifland guberniya, i.e. the Baltic region). The book shows that the high birth rate in Russia was mainly from early marriages of country population. By 1910, over one half of all brides were 20 or younger. In Astrakhan' guberniya, this group of brides constituted nearly 80% of the total. In Western European Russia the percentage of young brides was only 20-25%, and the birth rate coefficient is only half of the average for European Russia. The infant death rate was extraordinarily high - more than a quarter of all born died in the first year of life: in some guberniyas (for instance Nizhniy Novgorod) over 1/3 died in the first year. Where in the

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